

WHAT IS CLAIMED IS:

1. A transmitter, comprising:
a turbo encoder adapted to generate a plurality of turbo encoded data blocks;
an inserter adapted to insert a training sequence before the turbo encoded data blocks
5 thereby creating a data frame;
a modulator coupled to the inserter to modulate the data frame; and
an output port adapted to transmit the modulated data frame.
2. The transmitter of claim 1 further comprising a submarker insertion device coupled to
10 the turbo decoder to insert a plurality of submarkers within the turbo encoded data blocks.
3. The transmitter of claim 1 wherein further comprising an input adapted to receive a
plurality of turbo encoded data blocks from the turbo encoder including an input queue.
- 15 4. The transmitter of claim 3 wherein the input queue comprises a first-in-first-out
storage device.
5. The transmitter of claim 1 further comprising a forward error correction device
including an output adapted to buffer the data frame, the output being coupled to the modulator.
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6. The transmitter of claim 5 wherein the output comprises an output queue.
7. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert
one of the submarkers between two turbo encoded data blocks.
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8. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert
each of the submarkers between different pairs of the turbo encoded data blocks.
9. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert
30 one of the submarkers within one of the turbo encoded data blocks.
10. The transmitter claim 2 wherein the submarker insertion device is adapted to insert
each of the submarkers within a different one of the turbo encoded data blocks.
- 35 11. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert

at least a portion of the training sequence between one of the turbo encoded data blocks in addition to inserting the training sequence at the beginning of the data frame.

12. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert the training sequence between one of the turbo encoded data blocks in addition to inserting the training sequence at the beginning of the data frame.

13. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert at least a portion of the training sequence between each of the turbo encoded data blocks in addition to inserting the training sequence at the beginning of the data frame.

14. The transmitter of claim 2 wherein the submarker insertion device is adapted to insert the training sequence between each of the turbo encoded data blocks in addition to inserting the training sequence at the beginning of the data frame.

15. The transmitter of claim 2 wherein the submarker insertion device is programmable as to the insertion of the submarkers within the turbo encoded data blocks.

16. The transmitter of claim 15 wherein the submarker insertion device is programmable to insert the submarkers between the turbo encoded data blocks or insert the submarkers within the turbo encoded data blocks

17 The transmitter of claim 5 wherein the forward error correction further comprises an input encoder, and an interleaver disposed between the input encoder and the turbo encoder.

18. The transmitter of claim 17 wherein the input encoder comprises a Reed Solomon encoder.

19. A transmitter, comprising:
 means for generating a plurality of turbo encoded data blocks;
 means for inserting a training sequence before the turbo encoded data blocks thereby creating a data frame;
 means for modulating the data frame; and
 means for transmitting the modulated data frame.

20. The transmitter of claim 19 further comprising means for inserting a plurality of submarkers within the turbo encoded data blocks.

21. A transmitter, comprising:

5 a turbo encoder adapted to generate a plurality of turbo encoded data blocks;
a submarker insertion device coupled to the turbo encoder to insert a plurality of submarkers within the turbo encoded data blocks;

an inserter adapted to insert a training sequence before the turbo encoded data blocks thereby creating a data frame; and

10 a modulator coupled to the inserter to modulate the data frame.